

**RESOLUTION A.327(IX)**

*Adopted on 12 November 1975  
Agenda item 7(c)*

**RECOMMENDATION CONCERNING FIRE SAFETY REQUIREMENTS  
FOR CARGO SHIPS**

THE ASSEMBLY,

NOTING Article 16(i) of the IMCO Convention concerning the functions of the Assembly,

NOTING FURTHER Resolution 1, item 3 of the International Conference on the Safety of Life at Sea, 1974 which calls for further improvements of fire safety requirements of ships, *inter alia* cargo ships,

HAVING CONSIDERED the Recommendation of the Maritime Safety Committee at its thirty-second session,

ADOPTS the Recommendation Concerning Fire Safety Requirements for Cargo Ships, the text of which is shown at Annex to this Resolution,

RECOMMENDS governments to apply the improved fire safety requirements for cargo ships in addition to:

- (a) the applicable requirements of Chapter II of the International Convention for the Safety of Life at Sea, 1960, or
- (b) the applicable requirements of Chapter II-2 of the International Convention for the Safety of Life at Sea, 1974, when that Convention comes into force,

INVITES all governments concerned:

- (a) to make known the provisions of the improved fire safety requirements for cargo ships to shipowners and operators under their jurisdiction;
- (b) to make every effort to ensure that the improved fire safety requirements for cargo ships apply uniformly to all new cargo ships as soon as possible;
- (c) to inform the Organization of measures taken by them in this respect,

REQUESTS the Maritime Safety Committee to continue work on this subject with a view to improving the requirements, in particular those for cargo ships carrying dangerous goods, and, at the appropriate time, to redraft the improved fire safety requirements for cargo ships for insertion into Chapter II-2 of the International Convention for the Safety of Life at Sea, 1974 with a view to their adoption as amendments to that Convention after its entry into force.

ANNEX

RECOMMENDATION CONCERNING FIRE SAFETY REQUIREMENTS  
FOR CARGO SHIPS

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## RECOMMENDATION CONCERNING FIRE SAFETY REQUIREMENTS FOR CARGO SHIPS

### Regulation 1

#### *Application*

These Requirements shall apply to cargo ships of 500 tons gross tonnage and upwards, in addition to:

- (a) the applicable requirements of Chapter II of the International Convention for the Safety of Life at Sea, 1960, or
- (b) the applicable requirements of Chapter II-2 of the International Convention for the Safety of Life at Sea, 1974, when that Convention comes into force.

### Regulation 2

#### *General*

The purpose of these Requirements is to provide an effective and practicable degree of fire protection in cargo ships. The basic principles underlying these Requirements are generally:

- (a) separation of accommodation spaces from the remainder of the ship by thermal and structural boundaries;
- (b) protection of means of escape;
- (c) early detection, containment or extinction of any fire in the space of origin; and
- (d) restricted use of combustible materials.

One of the following methods of protection shall be adopted in accommodation and service spaces with a view to fulfilling the basic principles (a) to (d) above. The requirements for the use of non-combustible materials in construction and insulation of the boundary bulkheads of machinery spaces, control stations etc., and the protection of stairway enclosures and corridors will be common to all three methods outlined below:

**Method IC** — The construction of all internal divisional bulkheading of non-combustible "B" or "C" Class divisions generally without the installation of a detection or sprinkler system in the accommodation and service spaces; or

**Method IIC** — The fitting of an automatic sprinkler and fire alarm system for the detection and extinction of fire in all spaces in which fire might be expected to originate, generally with no restriction on the type of internal divisional bulkheading; or

**Method IIIC** — The fitting of an automatic fire detection and alarm system in all spaces in which a fire might be expected to originate, generally with no restriction on the type of internal divisional bulkheading, except that in no case must the area of any accommodation space or spaces bounded by an "A" or "B" Class division exceed 50 square metres. Consideration may be given by the Administration to increasing this area for public spaces.

### **Regulation 3**

#### ***Definitions***

Except as specified in this Regulation the terms used in these Requirements shall be as defined in Regulation 3 of Chapter II-2 of the International Convention for the Safety of Life at Sea, 1974 (hereinafter referred to as the Convention).

(a) "Accommodation Spaces" are those used for public spaces, corridors, lavatories, cabins, offices, hospitals, cinemas, games and hobbies rooms, pantries containing no cooking appliances and similar spaces. Public spaces are those portions of the accommodation which are used for halls, dining rooms, lounges and similar permanently enclosed spaces.

(b) "Service Spaces" are those used for galleys, pantries containing cooking appliances, lockers and store-rooms, workshops other than those forming part of the machinery spaces, and similar spaces and trunks to such spaces.

### **Regulation 4**

#### ***Structure***

(a) The hull, superstructure, structural bulkheads, decks and deckhouses shall be constructed of steel or other equivalent material except as otherwise specified in paragraph (d) of this Regulation.

(b) The insulation of aluminium alloy components of "A" or "B" Class divisions, except structure which in the opinion of the Administration is non load-bearing, shall be such that the temperature of the structural core does not rise more than 200°C above the ambient temperature at any time during the applicable fire exposure to the standard fire test.

(c) Special attention shall be given to the insulation of aluminium alloy components of columns, stanchions and other structural members required to support lifeboat and liferaft stowage, launching and embarkation areas, and "A" and "B" Class divisions, to ensure:

- (i) that for such members supporting lifeboat and liferaft areas and "A" Class divisions, the temperature rise limitation specified in paragraph (b) of this Regulation shall apply at the end of one hour; and
- (ii) that for such members required to support "B" Class divisions, the temperature rise limitation specified in paragraph (b) of this Regulation shall apply at the end of one-half hour.

(d) Crowns and casings of machinery spaces of Category A shall be of steel construction adequately insulated and openings therein, if any, shall be suitably arranged and protected to prevent the spread of fire.

### **Regulation 5**

#### ***Bulkheads within the Accommodation and Service Spaces***

(a) All bulkheads required to be "B" Class divisions shall extend from deck to deck and to the shell or other boundaries, unless continuous "B" Class ceilings and/or linings are fitted on both sides of the bulkhead in which case the bulkhead may terminate at the continuous ceiling or lining.

(b) **Method 1C.** All bulkheads not required by this or other Regulations of these Requirements to be "A" or "B" Class divisions, shall be of at least "C" Class construction.

(c) **Method IIC.** There shall be no restriction on the construction of bulkheads not required by this or other Regulations of these Requirements to be "A" or "B" Class divisions except in individual cases where Class "C" bulkheads are required in accordance with Table 1 in Regulation 8 of these Requirements.

(d) **Method IIIC.** There shall be no restriction on the construction of bulkheads not required by this or other Regulations of these Requirements to be "A" or "B" Class divisions except that in no case must the area of any accommodation space or spaces bounded by a continuous "A" or "B" Class division exceed 50 square metres, except in individual cases where Class "C" bulkheads are required in accordance with Table 1 in Regulation 8 of these Requirements. Consideration may be given by the Administration to increasing this area for public spaces.

## **Regulation 6**

### ***Protection of Stairways and Lift Trunks in Accommodation Spaces, Service Spaces and Control Stations***

(a) Stairways which penetrate only a single deck shall be protected at least at one level by at least "B-0" Class divisions and self-closing doors. Lifts which penetrate only a single deck shall be surrounded by "A-0" Class divisions with steel doors at both levels. Stairways and lift trunks which penetrate more than a single deck shall be surrounded by at least "A-0" Class divisions and protected by self-closing doors at all levels.

(b) On ships having accommodation for 12 persons or less, where stairways penetrate more than a single deck and where there are at least two escapes direct to the open deck at every accommodation level, consideration may be given by the Administration to reducing the "A-0" requirements contained in paragraph (a) of this Regulation to "B-0".

(c) All stairways shall be of steel frame construction except where the Administration sanctions the use of other equivalent material.

## **Regulation 7**

### ***Doors in Fire Resisting Divisions***

(a) Doors shall be equivalent in resisting fire as far as practicable to the division in which they are fitted. Doors and door frames in "A" Class divisions shall be constructed of steel. Doors in "B" Class divisions shall be non-combustible. Doors fitted in boundary bulkheads of machinery spaces of Category A shall be reasonably gas-tight and self-closing. An Administration may permit the use of combustible materials on board ships constructed according to Method IC in doors separating cabins from the individual interior sanitary accommodation, such as showers.

(b) Doors required to be self-closing shall not be fitted with hold-back hooks. However, hold-back arrangements fitted with remote release fittings of the fail-safe type may be utilized.

(c) Ventilation openings may be permitted in and under the doors in corridor bulkheads except that such openings are not permitted in and under stairways enclosure doors. The openings shall be provided only in the lower half of a door. Where such opening is in or under a door the total net area of any such opening or openings shall not exceed 0.05 square metre. When such opening is cut in a door it shall be fitted with a grille made of non-combustible material.

(d) Watertight doors need not be insulated.

## Regulation 8

### *Fire Integrity of Bulkheads and Decks*

(a) In addition to complying with the specific provisions for fire integrity of bulkheads and decks mentioned elsewhere in these Requirements, the minimum fire integrity of bulkheads and decks shall be as prescribed in Table 1 and Table 2 of this Regulation.

(b) The following requirements shall govern application of the tables:

(i) Tables 1 and 2 shall apply respectively to the bulkheads and decks separating adjacent spaces.

(ii) For determining the appropriate fire integrity standards to be applied to divisions between adjacent spaces, such spaces are classified according to their fire risk as shown in Categories (1) to (10) below. The title of each category is intended to be typical rather than restrictive. The number in parenthesis preceding each category refers to the applicable column or row in the tables.

(1) ***Control Stations***

Spaces containing emergency sources of power and lighting.

Wheelhouse and chartroom.

Spaces containing the ship's radio equipment.

Fire-extinguishing rooms, fire-control rooms and fire-recording stations.

Control room for propelling machinery when located outside the machinery space.

Spaces containing centralized fire alarm equipment.

(2) ***Corridors***

Corridors and lobbies.

(3) ***Accommodation Spaces***

Spaces as defined in Regulation 3(a) excluding corridors.

(4) ***Stairways***

Interior stairways, lifts and escalators (other than those wholly contained within the machinery spaces) and enclosures thereto.

In this connexion, a stairway which is enclosed only at one level shall be regarded as part of the space from which it is not separated by a fire door.

(5) ***Service Spaces (Low Risk)***

Lockers and store-rooms having areas of less than 2 square metres, drying rooms and laundries.

(6) ***Machinery Spaces of Category A***

Spaces as defined in Regulation 3(o) of Chapter II-2 of the Convention.

(7) ***Other Machinery Spaces***

Spaces as defined in Regulation 3(p) of Chapter II-2 of the Convention excluding machinery spaces of Category A.

(8) ***Cargo Spaces***

All spaces used for cargo (including cargo oil tanks) and trunkways and hatchways to such spaces.

(9) ***Service Spaces (High Risk)***

Galleys, pantries containing cooking appliances, paint and lamp rooms, lockers and store-rooms having areas of 2 square metres or more, workshops other than those forming part of the machinery spaces.

(10) ***Open Decks***

Open deck spaces and enclosed promenades containing no fire risk. Air spaces (the space outside superstructures and deckhouses).

TABLE 1 – FIRE INTEGRITY OF BULKHEADS SEPARATING ADJACENT SPACES

Spaces	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Control Stations (1)	A-0 <sub>e/</sub>	A-0	A-60	A-0	A-15	A-60	A-15	A-60	A-60	*
Corridors (2)		C	B-0	B-0 A-0 <sub>c/</sub>	B-0	A-60	A-0	A-0	A-0	*
Accommodation Spaces (3)			C <sub>a,b/</sub>	B-0 A-0 <sub>c/</sub>	B-0	A-60	A-0	A-0	A-0	*
Stairways (4)				B-0 A-0 <sub>c/</sub>	B-0 A-0 <sub>c/</sub>	A-60	A-0	A-0	A-0	* *
Service Spaces (Low Risk) (5)					C	A-60	A-0	A-0	A-0	*
Machinery Spaces of Category A (6)						*	A-0	A-0	A-60	*
Other Machinery Spaces (7)							A-0 <sub>d/</sub>	A-0	A-0	*
Cargo Spaces (8)								*	A-0	*
Service Spaces (High Risk) (9)									A-0 <sub>d/</sub>	*
Open Decks (10)										—

**Notes:** To be applied to both Tables 1 and 2, as appropriate.

a/ No special requirements are imposed upon bulkheads in Methods IIC and IIIC fire protection.

b/ In case of Method IIIC "B" Class bulkheads of "B-0" rating shall be provided between spaces or groups of spaces of 50 square metres and over in area.

c/ For clarification as to which applies see Regulations 5 and 6 of these Requirements.

d/ Where spaces are of the same numerical category and superscript d appears, a bulkhead or deck of the rating shown in the tables is only required when the adjacent spaces are for a different purpose, e.g. in category (9). A galley next to a galley does not require a bulkhead but a galley next to a paint room requires an "A-0" bulkhead.

e/ Bulkheads separating the wheelhouse, chartroom and radio room from each other may be "B-0" rating.

\* Where an asterisk appears in the tables the division is required to be of steel or equivalent material but is not required to be of "A" Class standard.

TABLE 2 – FIRE INTEGRITY OF DECKS SEPARATING ADJACENT SPACES

Space Below ↓	Space Above →	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Control Stations	(1)	A-0	A-0	A-0	A-0	A-0	A-60	A-0	A-0	A-0	*
Corridors	(2)	A-0	*	*	A-0	*	A-60	A-0	A-0	A-0	*
Accommodation Spaces	(3)	A-60	A-0	*	A-0	*	A-60	A-0	A-0	A-0	*
Stairways	(4)	A-0	A-0	A-0	*	A-0	A-60	A-0	A-0	A-0	*
Service Spaces (Low Risk)	(5)	A-15	A-0	A-0	A-0	*	A-60	A-0	A-0	A-0	*
Machinery Spaces of Category A	(6)	A-60	A-60	A-60	A-60	A-60	*	A-60	A-30	A-60	*
Other Machinery Spaces	(7)	A-15	A-0	A-0	A-0	A-0	A-0	*	A-0	A-0	*
Cargo Spaces	(8)	A-60	A-0	A-0	A-0	A-0	A-0	A-0	*	A-0	*
Service Spaces (High Risk)	(9)	A-60	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0 <sub>d/</sub>	*
Open Decks	(10)	*	*	*	*	*	*	*	*	*	—

(c) Continuous "B" Class ceilings or linings, in association with the relevant decks or bulkheads, may be accepted as contributing, wholly or in part, to the required insulation and integrity of a division.

(d) Windows and skylights in machinery spaces shall be as follows:

- (i) Skylights shall be capable of being opened and closed from outside the space in the event of a fire. Skylights shall not contain glass panels.
- (ii) Glass or similar materials shall not be fitted in machinery space boundaries. This does not preclude the use of glass in control rooms within the machinery spaces.

(e) External boundaries which are required in paragraph (a) of Regulation 4 of these Requirements to be of steel or equivalent material may be pierced for the fitting of windows and side scuttles provided that there is no requirement for such boundaries to have "A" Class integrity elsewhere in these Requirements. Similarly, in such boundaries which are not required to have "A" Class integrity, doors may be of materials to the satisfaction of the Administration.



## Regulation 9

### *Details of Construction*

- (a) **Method IC.** In accommodation and service spaces and control stations all linings, draught stops, ceilings and their associated grounds shall be of non-combustible materials.
- (b) **Methods IIC and IIIC.** In corridors and stairway enclosures serving accommodation and service spaces and control stations, ceilings (where fitted), linings, draught stops and their associated grounds shall be of non-combustible materials.
- (c) **Methods IC, IIC and IIIC**
  - (i) Except in cargo spaces or refrigerated compartments of service spaces, insulating materials shall be non-combustible. Vapour barriers and adhesives used in conjunction with insulation, as well as the insulation of pipe fittings, for cold service systems need not be of non-combustible material, but they shall be kept to the minimum quantity practicable and their exposed surfaces shall have qualities of resistance to the propagation of flame to the satisfaction of the Administration. In spaces where penetration of oil products is possible, the surface of insulation shall be impervious to oil or oil vapours.
  - (ii) Where non-combustible bulkheads, linings and ceilings are fitted in accommodation and service spaces, they may have a combustible veneer not exceeding 2.0 millimetres in thickness within any such space except corridors, stairway enclosures and control stations, where it shall not exceed 1.5 millimetres in thickness.
  - (iii) Air spaces enclosed behind ceilings, panellings, or linings shall be divided by close-fitting draught stops spaced not more than 14 metres apart.

## Regulation 10

### *Miscellaneous Items*

- (a) All exposed surfaces in corridors and stairway enclosures and surfaces including grounds in concealed or inaccessible spaces in accommodation and service spaces and control stations shall have low flame spread characteristics.\* Exposed surfaces of ceilings in accommodation and service spaces and control stations shall have low flame spread characteristics.
- (b) Paints, varnishes and other finishes used on exposed interior surfaces shall not be of a nature to offer an undue fire hazard in the judgment of the Administration and shall not be capable of producing excessive quantities of smoke.
- (c) Primary deck coverings, if applied, in accommodation and service spaces and control stations shall be of materials which, in the judgment of the Administration, will not readily ignite.\*\*
- (d) Where "A" or "B" Class divisions are penetrated for the passage of electrical cables, pipes, trunks, ducts, etc. or for the fitting of ventilation terminals, lighting fixtures and similar devices, arrangements shall be made to ensure that the fire resistance is not impaired.

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\* Reference is made to Guidelines on the Evaluation of Fire Hazard Properties of Materials, adopted by the Organization by Resolution A.166(ES.IV).

\*\* Reference is made to Improved Provisional Guidelines on Test Procedures for Primary Deck Coverings, adopted by the Organization by Resolution A.214(VII).

- (e) (i) Ventilation ducts shall be of non-combustible material. Short ducts, however, not generally exceeding 2 metres in length and with a cross-section not exceeding 0.02 square metre need not be non-combustible, subject to the following conditions:
- (1) These ducts shall be of a material which, in the opinion of the Administration, has a low fire risk.
  - (2) They may only be used at the end of the ventilation device.
  - (3) They shall not be situated less than 600 millimetres, measured along the duct, from an opening in an "A" or "B" Class division including continuous "B" Class ceilings.
- (ii) Where the ventilation ducts with a free-sectional area exceeding 0.02 square metre pass through Class "A" bulkheads or decks, the opening should be lined with a steel sheet sleeve unless the ducts passing through the bulkheads or decks are of steel in the vicinity of passage through the deck or bulkhead and comply in this part with the following specification:
- (1) For ducts with a free cross-sectional area exceeding 0.02 square metre, the sleeves shall have a thickness of at least 3 millimetres and a length of 900 millimetres. When passing through bulkheads, this length shall be divided preferably into 450 millimetres on each side of the bulkhead. Ducts with a free cross-sectional area exceeding 0.02 square metre or sleeves lining ducts with a free cross-sectional area exceeding 0.02 square metre shall be provided with fire insulation. The insulation shall have at least the same fire integrity as the bulkhead or deck through which the duct passes. Equivalent penetration protection may be provided to the satisfaction of the Administration.
  - (2) Ducts with a free cross-sectional area exceeding 0.075 square metre shall be fitted with fire dampers in addition to the requirements of sub-paragraph (ii)(1) of this paragraph. The fire damper shall operate automatically but shall also be capable of being closed manually from both sides of the bulkhead or deck. The damper shall be provided with an indicator which shows whether the damper is open or closed. Fire dampers are not required, however, where ducts pass through spaces surrounded by "A" Class divisions, without serving those spaces, provided those ducts have the same fire integrity as the bulkheads which they pierce.
- (iii) Ducts for ventilation of machinery spaces of Category A, galleys or car deck spaces, shall be insulated to the same degree as the division where they pass through accommodation spaces, service spaces or control stations. The same shall apply to ducts provided for ventilation of accommodation spaces, service spaces or control stations which pass through machinery spaces of Category A, galleys or car deck spaces.
- (iv) Where ventilation ducts with a free cross-sectional area exceeding 0.02 square metre pass through "B" Class bulkheads, the openings shall be lined with steel sheet sleeves of 900 millimetres in length, unless the ducts are of steel for this length in way of the bulkhead. When passing through a "B" Class bulkhead this length shall be divided preferably into 450 millimetres on each side of the bulkhead.
- (v) Such measures as are practicable shall be taken in respect of control stations outside machinery spaces in order to ensure that ventilation, visibility and freedom from smoke are maintained, so that in the event of fire the machinery and equipment contained therein may be supervised and continue to function effectively. Alternative and separate means of air supply shall be provided; air inlets of the two sources of supply shall be so disposed that the risk of both inlets drawing in smoke simultaneously is minimized. At the discretion of the Administration, such requirements need not apply to control stations situated on, and opening on to, an open deck, or where local closing arrangements would be equally effective.

(vi) Where they pass through accommodation spaces or spaces containing combustible materials, the exhaust ducts from galley ranges shall be constructed of "A" Class divisions. Each exhaust duct shall be fitted with:

- (1) a grease trap readily removable for cleaning;
- (2) a fire damper located in the lower end of the duct;
- (3) arrangements, operable from within the galley, for shutting off the exhaust fan; and
- (4) fixed means for extinguishing a fire within the duct.

(f) The main inlets and outlets of all ventilation systems shall be capable of being closed from outside the spaces being ventilated. Power ventilation of accommodation spaces, service spaces, control stations and machinery spaces shall be capable of being stopped from an easily accessible position outside the space being served. This position should not be readily cut off in the event of a fire in the spaces served. The means provided for stopping the power ventilation of the machinery spaces shall be entirely separate from the means provided for stopping ventilation of other spaces.

(g) (i) In accommodation and service spaces and control stations, pipes penetrating "A" or "B" Class divisions shall be of materials approved by the Administration having regard to the temperature such divisions are required to withstand. Where the Administration may permit the conveying of oil and combustible liquids through accommodation and service spaces, the pipes conveying oil or combustible liquids shall be of a material approved by the Administration having regard to the fire risk.

(ii) Materials readily rendered ineffective by heat shall not be used for overboard scuppers, sanitary discharges, and other outlets which are close to the water-line and where the failure of the material in the event of fire would give rise to danger of flooding.

(h) Electric radiators, if used, must be fixed in position and so constructed as to reduce fire risks to a minimum. No such radiators shall be fitted with an element so exposed that clothing, curtains or other inflammable materials can be scorched or set on fire by heat from the element.

(i) Where gaseous fuel is used for domestic purposes the arrangements, storage, distribution and utilization of the fuel shall be such that, having regard to the hazards of fire and explosion which the use of such fuel may entail, the safety of the ship and the persons on board is preserved.

(j) Cellulose-nitrate-based film shall not be used in cinematograph installations.

(k) All waste receptacles shall be constructed of non-combustible materials with no openings in the sides and bottom.

## **Regulation 11**

### ***Arrangements for Oil Fuel, Lubricating Oil and and other Inflammable Oils***

(a) ***Limitations in the Use of Oil and Fuel.*** The following limitations shall apply to the use of oil as fuel:

- (i) Except as otherwise permitted by this paragraph, no oil fuel with a flashpoint of less than 60°C shall be used.

- (ii) For use in emergency generators oil fuel of a flashpoint of not less than 43°C may be used.
- (iii) Subject to such additional precautions as it may consider necessary and on condition that the temperature of the space in which such oil fuel is stored or used shall not be allowed to rise to within 10°C below the flashpoint of the oil fuel, the Administration may permit the general use of oil fuel having a flashpoint of less than 60°C but not less than 43°C.
- (iv) The use of fuel having a lower flashpoint than otherwise specified in this paragraph, for example crude oil, may be permitted provided that such fuel is not stored in any machinery space and subject to the approval by the Administration of the complete installation.

The flashpoint of oils shall be determined by an approved closed cup method.

(b) **Oil Fuel Arrangements.** In a ship in which oil fuel is used, the arrangements for the storage, distribution and utilization of the oil fuel shall be such as to ensure the safety of the ship and persons on board and shall at least comply with the following provisions:

- (i) As far as practicable, no part of the oil fuel system containing heated oil under pressure exceeding 1.8 kilogrammes per square centimetre gauge shall be placed in such a concealed position that defects and leakage cannot readily be observed. In way of such parts of the oil fuel system the machinery spaces shall be adequately illuminated.
- (ii) The ventilation of machinery spaces shall be sufficient under all normal conditions to prevent accumulation of oil vapour.
- (iii)
  - (1) As far as practicable, oil fuel tanks shall be part of the ship's structure and shall be located outside of machinery spaces of Category A. Where oil fuel tanks, other than double bottom tanks, are necessarily located adjacent to or within machinery spaces of Category A, at least one of their vertical sides shall be contiguous to the machinery space boundaries, and shall preferably have a common boundary with the double bottom tanks where fitted and the area of the tank boundary common with the machinery space shall be kept to a minimum. When such tanks are sited within the boundaries of machinery spaces of Category A they shall not contain fuel oil having a flashpoint of less than 60°C. In general, the use of free-standing oil fuel tanks shall be avoided in fire hazard areas, and particularly in machinery spaces of Category A. When free-standing oil tanks are permitted, they shall be placed in an oil-tight spill tray of ample size having a suitable drain pipe leading to a suitably sized spill oil tank.
  - (2) No oil tank shall be situated where spillage or leakage therefrom can constitute a hazard by falling on heated surfaces. Precautions shall be taken to prevent any oil that may escape under pressure from any pump, filter or heater from coming into contact with heated surfaces.
- (iv) Every oil fuel pipe, which, if damaged, would allow oil to escape from a storage, settling or daily service tank situated above the double bottom shall be fitted with a cock or valve directly on the tank capable of being closed from a safe position outside the space concerned in the event of a fire arising in the space in which such tanks are situated. In the special case of deep tanks situated in any shaft or pipe tunnel or similar space, valves on the tank shall be fitted but control in the event of fire may be effected by means of an additional valve on the pipe or pipes outside the tunnel or similar space. If such additional valve is fitted in the machinery space it shall be operated outside this space.

- (v) Safe and efficient means of ascertaining the amount of oil fuel contained in any oil tank shall be provided. Sounding pipes with suitable means of closure may be permitted if their upper ends terminate in safe positions. Other means of ascertaining the amount of oil fuel contained in any oil fuel tank may be permitted, providing their failure or overfilling of the tanks will not permit release of fuel thereby. The use of cylindrical gauge glasses is prohibited. The Administration may permit the use of oil level gauges with flat glasses and self-closing valves between the gauges and oil tanks.
- (vi) Provision shall be made to prevent over-pressure in any oil tank or in any part of the oil fuel system, including the filling pipes. Any relief valves and air or overflow pipes shall discharge to a position which, in the opinion of the Administration, is safe.
- (vii) Oil fuel pipes and their valves and fittings shall be of steel or other approved material, provided that restricted use of flexible pipes shall be permissible in positions where the Administration is satisfied that they are necessary. Such flexible pipes and end attachments shall be of approved fire-resisting materials of adequate strength and shall be constructed to the satisfaction of the Administration.

(c) ***Lubrication Oil Arrangements.*** The arrangements for the storage, distribution and utilization of oil used in pressure lubrication systems shall be such as to ensure the safety of the ship and persons on board. Such arrangements in machinery spaces of Category A and, whenever practicable, in other machinery spaces shall at least comply with the provisions of sub-paragraphs (i), (iii)(2), (vi) and (vii), and in so far as the Administration may consider necessary with sub-paragraphs (iv) and (v) of paragraph (b) of this Regulation. This does not preclude the use of sight flow glasses in lubricating systems provided they are shown by test to have a suitable degree of fire resistance.

(d) ***Arrangements for other Inflammable Oils.*** The arrangements for the storage, distribution and utilization of other inflammable oils employed under pressure in power transmission systems, control and activating systems and heating systems shall be such as to ensure the safety of the ship and persons on board. In locations where means of ignition are present, such arrangements shall at least comply with the provisions of sub-paragraphs (iii)(2) and (v), and with the provisions of sub-paragraphs (vi) and (vii) in respect of strength and construction, of paragraph (b) of this Regulation.

## Regulation 12

### *Means of Escape*

(a) In and from all accommodation spaces and in spaces in which the crew is normally employed, other than machinery spaces, stairways and ladders shall be arranged so as to provide ready means of escape to the open deck and thence to the lifeboats and liferafts. In particular the following general provisions shall be complied with:

- (i) At all levels of accommodation there shall be provided at least two widely separated means of escape from each restricted space or groups of spaces.
- (ii) (1) Below the weather deck the main means of escape shall be a stairway and the second escape may be a trunk or a stairway.
- (2) Above the weather deck the means of escape shall be stairways or doors to an open deck or a combination thereof.

- (iii) Exceptionally the Administration may dispense with one of the means of escape, due regard being paid to the nature and location of spaces and to the number of persons who normally might be quartered or employed there.
  - (iv) No dead-end corridors having a length of more than 7 metres shall be accepted. A dead-end corridor is a corridor or part of a corridor from which there is only one route of escape.
  - (v) The width and continuity of the means of the escape shall be to the satisfaction of the Administration.
  - (vi) If a radiotelegraph station has no direct access to the open deck, two means of access to or egress from such station shall be provided, one of which may be a porthole or window of sufficient size or other means to the satisfaction of the Administration, to provide an emergency escape.
- (b) Two means of escape shall be provided from each machinery space of Category A. In particular, one of the following provisions shall be complied with:
- (i) two sets of steel ladders as widely separated as possible leading to doors in the upper part of the space similarly separated and from which access is provided to the open deck. In general, one of these ladders shall provide continuous fire shelter from the lower part of the space to a safe position outside the space. However, the Administration may not require the shelter if, due to special arrangements or dimensions of machinery space, a safe escape route from the lower part of this space will be provided. This shelter shall be of steel, insulated, where necessary, to the satisfaction of the Administration and be provided with a self-closing steel door at the lower end; or
  - (ii) one steel ladder leading to a door in the upper part of the space from which access is provided to the open deck and additionally, in the lower part of the space and in a position well separated from the ladder referred to, a steel door capable of being operated from each side and which provides access to a safe escape route from the lower part of the space to the open deck. Provided that in a ship of less than 1,000 tons gross tonnage, the Administration may dispense with one of the means of escape due regard being paid to the dimension and disposition of the upper part of the space.
- (c) From machinery spaces other than those of Category A, escape routes shall be provided to the satisfaction of the Administration having regard to the nature and location of the space and whether persons are normally employed in that space.
- (d) Lifts shall not be considered as forming one of the required means of escape as required by this Regulation.

### **Regulation 13**

#### ***Automatic Sprinkler and Fire Alarm and Detection System (Method IIC)***

In ships in which Method IIC is adopted, an automatic sprinkler and fire alarm and detection system of an approved type and complying with the requirements of Regulation 14 of these Requirements shall be installed and so arranged as to protect accommodation spaces, galleys, and other service spaces, except spaces which afford no substantial fire risk (such as void spaces, sanitary spaces, etc.).

**Regulation 14*****Automatic Sprinkler and Fire Alarm and Fire Detection System***

Where an automatic sprinkler and fire alarm and fire detection system is provided in compliance with the provisions of Regulation 13 of these Requirements, it shall be to the satisfaction of the Administration and shall comply with the following requirements:

- (a) (i) Any required automatic sprinkler and fire alarm and fire detection system shall be capable of immediate operation at all times and no action by the crew shall be necessary to set it in operation. It shall be of the wet pipe type but small exposed sections may be of the dry pipe type where in the opinion of the Administration this is a necessary precaution. Any parts of the system which may be subjected to freezing temperatures in service shall be suitably protected against freezing. It shall be kept charged at the necessary pressure and shall have provision for a continuous supply of water as required in this Regulation.
- (ii) Each section of sprinklers shall include means for giving a visible and audible alarm signal automatically at one or more indicating units whenever any sprinkler comes into operation. Such units shall indicate in which section served by the system, fire has occurred and shall be centralized on the navigating bridge and in addition, visible and audible alarms from the unit shall be placed in a position other than on the navigating bridge, so as to ensure that the indication of fire is immediately received by the crew. Such an alarm system shall be constructed so as to indicate if any fault occurs in the system.
- (b) (i) Sprinklers shall be grouped into separate sections, each of which shall contain not more than 200 sprinklers.
- (ii) Each section of sprinklers shall be capable of being isolated by one stop valve only. The stop valve in each section shall be readily accessible and its location shall be clearly and permanently indicated. Means shall be provided to prevent the operation of the stop valves by any unauthorized person.
- (iii) A gauge indicating the pressure in the system shall be provided at each section stop valve and at a central station.
- (iv) The sprinklers shall be resistant to corrosion by marine atmosphere. In accommodation and service spaces the sprinklers shall come into operation within the temperature range of 68°C and 79°C, except that in locations such as drying rooms, where high ambient temperatures might be expected, the operating temperature may be increased by not more than 30°C above the maximum deck head temperature.
- (v) A list or plan shall be displayed at each indicating unit showing the spaces covered and the location of the zone in respect of each section. Suitable instructions for testing and maintenance shall be available.
- (c) Sprinklers shall be placed in an overhead position and spaced in a suitable pattern to maintain an average application rate of not less than 5 litres per square metre per minute over the nominal area covered by the sprinklers. However, the Administration may permit the use of sprinklers providing such an alternative amount of water suitably distributed as has been shown to the satisfaction of the Administration to be not less effective.
- (d) (i) A pressure tank having a volume equal to at least twice that of the charge of water specified in this sub-paragraph shall be provided. The tank shall contain a standing charge of fresh water, equivalent to the amount of water which would be discharged in one minute by the pump referred to in sub-paragraph (e)(ii) of this Regulation, and

the arrangements shall provide for maintaining such air pressure in the tank as to ensure that where the standing charge of fresh water in the tank has been used the pressure will be not less than the working pressure of the sprinkler, plus the pressure due to a head of water measured from the bottom of the tank to the highest sprinkler in the system. Suitable means of replenishing the air under pressure and of replenishing the fresh water charge in the tank shall be provided. A glass gauge shall be provided to indicate the correct level of the water in the tank.

- (ii) Means shall be provided to prevent the passage of sea-water into the tank.
- (e)
  - (i) An independent power pump shall be provided solely for the purpose of continuing automatically the discharge of water from the sprinklers. The pump shall be brought into action automatically by the pressure drop in the system before the standing fresh water charge in the pressure tank is completely exhausted.
  - (ii) The pump and the piping system shall be capable of maintaining the necessary pressure at the level of the highest sprinkler to ensure a continuous output of water sufficient for the simultaneous coverage of a minimum area of 280 square metres at the application rate specified in paragraph (c) of this Regulation.
  - (iii) The pump shall have fitted on the delivery side a test valve with a short open-ended discharge pipe. The effective area through the valve and pipe shall be adequate to permit the release of the required pump output while maintaining the pressure in the system specified in sub-paragraph (d)(i) of this Regulation.
  - (iv) The sea inlet to the pump shall, wherever possible, be in the space containing the pump and shall be so arranged that when the ship is afloat it will not be necessary to shut off the supply of sea-water to the pump for any purpose other than the inspection or repair of the pump.
- (f) The sprinkler pump and tank shall be situated in a position reasonably remote from any machinery space of Category A and shall not be situated in any space required to be protected by the sprinkler system.
- (g) There shall not be less than two sources of power supply for the sea-water pump and automatic alarm and detection system. If the pump is electrically driven it shall be connected to the main source of electrical power, which shall be capable of being supplied by at least two generators.

The feeders shall be arranged so as to avoid galleys, machinery spaces and other enclosed spaces of high fire risk except in so far as it is necessary to reach the appropriate switchboard. One of the sources of power supply for the alarm and detection system shall be an emergency source. Where one of the sources of power for the pump is an internal combustion-type engine it shall, in addition to complying with the provisions of paragraph (f) of this Regulation, be so situated that a fire in any protected space will not affect the air supply to the machinery.

(h) The sprinkler system shall have a connexion from the ship's fire main by way of a lockable screw-down non-return valve at the connexion which will prevent a backflow from the sprinkler system to the fire main.

- (i)
  - (i) A test valve shall be provided for testing the automatic alarm for each section of sprinklers by a discharge of water equivalent to the operation of one sprinkler. The test valve for each section shall be situated near the stop valve for that section.
  - (ii) Means shall be provided for testing the automatic operation of the pump, on reduction of pressure in the system.



- (iii) Switches shall be provided at one of the indicating positions referred to in subparagraph (a)(ii) of this Regulation which will enable the alarm and the indicators for each section of sprinklers to be tested.
- (j) Spare sprinkler heads shall be provided for each section of sprinklers to the satisfaction of the Administration.

### **Regulation 15**

#### ***Automatic Fire Alarm and Fire Detection System (Method IIIC)***

In ships in which Method IIIC is adopted, an automatic fire alarm detection system of an approved type and complying with the requirements of Regulation 16 of these Requirements shall be installed and so arranged as to detect the presence of fires in all accommodation spaces and service spaces, except spaces which afford no substantial fire risk (such as void spaces, sanitary spaces, etc.).

### **Regulation 16**

#### ***Automatic Fire Alarm and Fire Detection System***

Where an automatic fire alarm and fire detection system is provided in compliance with the provisions of Regulation 15 of these Requirements, it shall be to the satisfaction of the Administration and shall comply with the following requirements:

- (a) (i) Any required automatic fire alarm and fire detection system shall be capable of immediate operation at all times and no action of the crew shall be necessary to set it in operation.
- (ii) Each section of detectors shall include means for giving a visible and audible alarm signal automatically at one or more indicating units whenever any detector comes into operation. Such units shall indicate in which section served by the system a fire has occurred and shall be centralized on the navigating bridge and such other positions to ensure that any alarm from the system is immediately received by a responsible member of the crew. Additionally, arrangements shall be provided to ensure that an alarm is sounded on the deck on which the fire has been detected. Such an alarm and detection system shall be constructed so as to indicate if any fault occurs in the system.
- (b) Detectors shall be grouped into separate sections, each covering not more than 50 rooms served by such a system and containing not more than 100 detectors. Detectors shall be zoned to indicate on which deck a fire has occurred.
- (c) The system shall be operated by an abnormal air temperature, by an abnormal concentration of smoke or by other factors indicative of incipient fire in any one of the spaces to be protected. Systems which are sensitive to air temperature shall not operate at less than 57°C and shall operate at a temperature not greater than 74°C when the temperature increase to those levels is not more than 1°C per minute. At the discretion of the Administration the permissible temperature of operation may be increased to 30°C above the maximum deckhead temperature in drying rooms and similar places of a normally high ambient temperature. Systems which are sensitive to smoke concentration shall operate on the reduction of the intensity of a transmitted light beam by an amount to be determined by the Administration. Other equally effective methods of operation may be accepted at the discretion of the Administration. The detection system shall not be used for any purpose other than fire detection.

(d) The detectors may be arranged to operate the alarm by the opening or closing of contacts or by other appropriate methods. They shall be fitted in an overhead position and shall be suitably protected against impact and physical damage. They shall be suitable for use in a marine atmosphere. They shall be placed in an open position clear of beams and other objects likely to obstruct the flow of hot gases or smoke to the sensitive element. Detectors operated by the closing of contacts shall be of the sealed contact type and the circuit shall be continuously monitored to indicate fault conditions.

(e) At least one detector shall be installed in each space where detection facilities are required and there shall be not less than one detector for approximately each 37 square metres of deck area. In large spaces the detectors shall be arranged in a regular pattern so that no detector is more than 9 metres from another detector or more than 4.5 metres from a bulk-head.

(f) There shall be not less than two sources of power supply for the electrical equipment used in the operation of the fire alarm and fire detection system, one of which shall be an emergency source. The supply shall be provided by separate feeders reserved solely for that purpose. Such feeders shall run to a change-over switch situated in the control station for the fire detection system. The wiring system shall be so arranged as to avoid galleys, machinery spaces and other enclosed spaces having a high fire risk except in so far as it is necessary to provide for fire detection in such spaces or to reach the appropriate switchboard.

(g) (i) A list or plan shall be displayed adjacent to each indicating unit showing the spaces covered and the location of the zone in respect of each section. Suitable instructions for testing and maintenance shall be available.

(ii) Provision shall be made for testing the correct operation of the detectors and the indicating units by supplying means for applying hot air or smoke at detector positions.

(h) Spare detector heads shall be provided for each section of detectors to the satisfaction of the Administration.

### **Regulation 17**

#### ***Fixed Fire-Extinguishing Arrangements in Cargo Spaces*** (Other than cargo spaces covered in Regulation 18)

(a) The cargo spaces of ships of 2,000 tons gross tonnage and upwards other than those spaces covered in Regulation 18 of these Requirements shall be protected by a fixed gas fire-extinguishing system complying with the provisions of Regulation 8 of Chapter II-2 of the Convention or by a fire-extinguishing system which gives equivalent protection.

(b) The Administration may exempt from the requirements of paragraph (a) of this Regulation the cargo spaces of any ship if it is constructed and solely intended for carrying ore, coal, grain, unseasoned timber and non-combustible cargoes or cargoes which, in the opinion of the Administration constitute a low fire risk. Such exemptions may be granted only if the ships are fitted with steel hatch covers and effective means of closing all ventilators and other openings leading to the cargo spaces.

(c) Ships engaged in the carriage of dangerous goods as classified in Regulation 2 of Chapter VII of the Convention shall be provided in any cargo spaces with a fixed gas fire-extinguishing system complying with the provisions of Regulation 8 of Chapter II-2 of the Convention or by a fire-extinguishing system which in the opinion of the Administration gives equivalent protection for the cargoes carried.

## Regulation 18

### *Cargo Spaces intended for the Carriage of Motor Vehicles with Fuel in their Tanks for their own Propulsion*

In any cargo space containing motor vehicles with fuel in their tanks for their own propulsion, the following provisions shall be complied with:

#### (a) *Fire Detection*

There shall be provided an approved automatic fire detection and fire alarm system. The design and arrangements of this system shall be considered in conjunction with the ventilation requirements referred to in paragraph (c) of this Regulation.

#### (b) *Fire-Extinguishing Arrangements*

- (i) There shall be fitted a fixed gas fire-extinguishing system which shall comply with the provisions of Regulation 8 of Chapter II-2 of the Convention, except that if a carbon dioxide system is fitted, the quantity of gas available shall be at least sufficient to give a minimum volume of free gas equal to 45 per cent of the gross volume of the largest such cargo space which is capable of being sealed, and the arrangements shall be such as to ensure that at least two-thirds of the gas required for the relevant space shall be introduced during 10 minutes. Any other fixed gas fire-extinguishing system or fixed high expansion froth fire-extinguishing system may be fitted provided it gives equivalent protection.
- (ii) As an alternative, a system meeting the requirements of Regulation 30(c) of Chapter II-2 of the Convention shall be fitted, provided that Regulation 30(i) of that Chapter is also complied with.\*
- (iii) There shall be provided for use in any such space such number of portable fire extinguishers of an approved type as the Administration may deem sufficient. At least one portable extinguisher shall be located at each access to the vehicle deck.

#### (c) *Ventilation System*

- (i) Cargo spaces shall be provided with an effective power ventilation system sufficient to provide at least six air changes per hour based on an empty hold. Ventilation fans shall normally be run continuously whenever vehicles are on board. Where this is impracticable, they shall be operated for a limited period daily as weather permits and in any case for a reasonable period prior to discharge, after which period the vehicle decks shall be proved gas free. One or more portable combustible gas detecting instruments shall be carried for this purpose. The system shall be entirely separate from other ventilating systems. The Administration may require an increased number of air changes when vehicles are being loaded or unloaded. The system shall be capable of being controlled from a position outside such spaces.
- (ii) The ventilation shall be such as to prevent air stratification and the formation of air pockets.
- (iii) Means shall be provided to indicate on the navigating bridge any loss of the required ventilating capacity.

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\* Reference is made to the Recommendation on Fixed Fire-Extinguishing Systems for Special Category Spaces, adopted by the Organization by Resolution A.123(V).

(d) *Precautions against Ignition of Inflammable Vapours*

- (i) Electrical equipment and wiring, if fitted, shall be of a type suitable for use in explosive petrol and air mixtures. Other equipment which may constitute a source of ignition of inflammable vapours shall not be permitted.
- (ii) Electrical equipment and wiring, if installed in an exhaust ventilation duct, shall be of a type approved for use in explosive petrol and air mixtures and the outlet from any exhaust duct shall be sited in a safe position, having regard to other possible sources of ignition.
- (iii) Scuppers shall not be led to machinery or other spaces where sources of ignition may be present.

**Regulation 19**

*Provision for Fire-Extinguishing Equipment*

(a) *Application*

Where ships have a lower gross tonnage than those quoted in this Regulation, the arrangements for the items covered in this Regulation shall be to the satisfaction of the Administration.

(b) *Fire Pumps and Fire Main System*

The ship shall be provided with fire pumps, fire main system, hydrants and hoses complying with Regulation 5 of Chapter II-2 of the Convention and with the following requirements:

- (i) A ship of 1,000 tons gross tonnage and upwards shall be provided with two independently driven power pumps.
- (ii) If a fire in any one compartment of any ship could put all the pumps out of action, there must be an alternative means of providing water for fire fighting. In a ship of 2,000 tons gross tonnage and upwards this alternative means shall be a fixed emergency pump independently driven. This emergency pump shall be capable of supplying two jets of water to the satisfaction of the Administration.

(c) *Fire Hydrants, Hoses and Nozzles*

- (i) In a ship of 1,000 tons gross tonnage and upwards the number of fire hoses to be provided, each complete with couplings and nozzles, shall be one for each 30 metres length of the ship and one spare but in no case less than five in all. This number does not include any hoses required in any engine or boiler room. The Administration may increase the number of the hoses required so as to ensure that hoses in sufficient number are available and accessible at all times, having regard to the type of the ship and the nature of the trade on which the ship is employed.
- (ii) In accommodation, service and machinery spaces, the number and position of hydrants shall be such as to comply with the requirements of paragraph (d) of Regulation 5 of Chapter II-2 of the Convention.
- (iii) In a ship the arrangements shall be such that at least two jets of water can reach any part of any cargo space when empty.
- (iv) All required hydrants in the machinery spaces of ships with oil-fired boilers or internal combustion type propelling machinery shall be fitted with hoses having nozzles as required in paragraph (g) of Regulation 5 of Chapter II-2 of the Convention.

(d) *International Shore Connexion*

- (i) A ship of 1,000 tons gross tonnage and upwards shall be provided with at least one international shore connexion, complying with paragraph (h) of Regulation 5 of Chapter II-2 of the Convention.
- (ii) Facilities shall be available enabling such a connexion to be used on either side of the ship.

(e) *Portable Fire Extinguishers in Accommodation and Service Spaces*

- (i) The ship shall be provided in accommodation and service spaces with such approved portable fire extinguishers as the Administration may deem appropriate and sufficient; in any case, their number shall not be less than five for ships of 1,000 tons gross tonnage and upwards.
- (ii) Spare charges shall be provided to the satisfaction of the Administration.
- (iii) Normally one of the portable fire extinguishers intended for use in any space shall be installed near the entrance to that space.

(f) *Spaces containing Oil-Fired Boilers or Oil Fuel Units*

- (i) There shall be provided any one of the following fixed fire-extinguishing systems:
  - (1) A pressure water-spraying system complying with the provisions of Regulation 11 of Chapter II-2 of the Convention.
  - (2) A gas system complying with the provisions of Regulation 8 of Chapter II-2 of the Convention.
  - (3) A froth system complying with the provisions of Regulation 9 of Chapter II-2 of the Convention.
  - (4) A high expansion froth system complying with the provisions of Regulation 10 of Chapter II-2 of the Convention.

In each case if the engine and boiler rooms are not entirely separate, or if fuel oil can drain from the boiler room into the engine room, the combined engine and boiler rooms shall be considered as one compartment.

- (ii) There shall be in each boiler room at least one set of portable air-froth equipment complying with the provisions of paragraph (d) of Regulation 7 of Chapter II-2 of the Convention.
- (iii) There shall be at least two approved portable extinguishers discharging froth or equivalent in each firing space in each boiler room and each space in which a part of the oil fuel installation is situated. There shall be not less than one approved froth-type extinguisher of at least 136 litres capacity or equivalent in each boiler room. These extinguishers shall be provided with hoses on reels suitable for reaching any part of the boiler room. In the case of domestic boilers of less than 175 kW, the Administration may consider relaxing the requirements of this sub-paragraph.
- (iv) In each firing space there shall be a receptacle containing sand, sawdust impregnated with soda or other approved dry material, in such quantity as may be required by the Administration. Alternatively an approved portable extinguisher may be substituted therefor.

(g) *Spaces containing Internal Combustion Machinery*

Spaces containing internal combustion machinery used either for main propulsion, or for other purposes when such machinery has in the aggregate a total power output of not less than 373 kW, shall be provided with the following arrangements:

- (i) There shall be one of the fire-extinguishing systems required by sub-paragraph (f)(i) of this Regulation.
- (ii) There shall be at least one set of portable air-froth equipment complying with the provisions of paragraph (d) of Regulation 7 of Chapter II-2 of the Convention.
- (iii) There shall be in each such space approved froth-type fire extinguishers, each of at least 45 litres capacity or equivalent, sufficient in number to enable froth or its equivalent to be directed on to any part of the fuel and lubricating oil pressure systems, gearing and other fire hazards. In addition, there shall be provided a sufficient number of portable froth extinguishers or equipment which shall be so located that an extinguisher is not more than 10 metres walking distance from any point in the space; provided that there shall be at least two such extinguishers in each such space. For smaller spaces the Administration may consider relaxing this requirement.

(h) *Spaces containing Steam Turbines or Enclosed Steam Engines*

In spaces containing steam turbines or enclosed steam engines used either for main propulsion or for other purposes when such machinery has in the aggregate a total power output of not less than 373 kW:

- (i) There shall be provided froth fire extinguishers each of at least 45 litres capacity or equivalent sufficient in number to enable froth or its equivalent to be directed on to any part of the pressure lubrication system, on to any part of the casings enclosing pressure lubricated parts of the turbines, engines or associated gearing, and any other fire hazards. Provided that such extinguishers shall not be required if protection at least equivalent to that of this sub-paragraph is provided in such spaces by a fixed fire-extinguishing system fitted in compliance with sub-paragraph (f)(i) of this Regulation.
- (ii) There shall be provided a sufficient number of portable froth extinguishers or equivalent which shall be so located that an extinguisher is not more than 10 metres walking distance from any point in the space; provided that there shall be at least two such extinguishers in each such space, and such extinguishers shall not be required in addition to any provided in compliance with sub-paragraph (g)(iii) of this Regulation.

(i) *Fire-Extinguishing Appliances in other Machinery Spaces*

Where, in the opinion of the Administration, a fire hazard exists in any machinery space for which no specific provisions for fire-extinguishing appliances are prescribed in paragraphs (f), (g) and (h) of this Regulation there shall be provided in, or adjacent to, that space such a number of approved portable fire extinguishers or other means of fire extinction as the Administration may deem sufficient.

(j) *Fixed Fire-Extinguishing Systems not required by these Requirements*

Where a fixed fire-extinguishing system not required by these Requirements is installed, such a system shall be to the satisfaction of the Administration.

(k) *Special Requirements for Machinery Spaces*

- (i) For any machinery space of Category A to which access is provided at a low level from an adjacent shaft tunnel, there shall be provided, in addition to any water-tight door and on the side remote from that machinery space, a light steel fire-screen door which shall be operable from each side.
- (ii) An automatic fire detection and alarm system shall be fitted in any machinery space in which the installation of automatic and remote control systems and equipment has been approved in lieu of continuous manning of the space.

**Regulation 20**

*Fireman's Outfits and Personal Equipment*

- (a) The ship, whether new or existing, shall carry at least two fireman's outfits complying with the requirements of Regulation 14 of Chapter II-2 of the Convention. Furthermore, Administrations may require in large ships additional sets of personal equipment and in tankers and special ships, such as factory ships, additional fireman's outfits.
- (b) For each fireman's outfit which includes a self-contained breathing apparatus as provided in paragraph (b) of Regulation 14 of Chapter II-2 of the Convention, spare charges shall be carried on a scale approved by the Administration.
- (c) The fireman's outfits and personal equipment shall be stored so as to be easily accessible and ready for use and, where more than one fireman's outfit and set of personal equipment are carried, they shall be stored in widely separated positions.

**Regulation 21**

*Acceptance of Substitutes*

Where in these Requirements any special type of appliance, apparatus, extinguishing medium or arrangement is specified, any other type of appliance, etc. may be allowed, provided the Administration is satisfied that it is not less effective.